

On page 1, between lines 4 and 5 please insert the heading: TECHNICAL FIELD OF THE INVENTION.

Please replace the paragraph beginning on line 5 of page 1, with the following rewritten paragraph:

--The invention relates to an in-house subsystem in a mobile radio network and/or a wired communication network, and in particular to, an in house subsystem in a mobile radio network having a fixed home base station, at least one repeater station (repeater) and at least one mobile station.--

On page 1, between lines 11 and 12 please insert the heading:
BACKGROUND OF THE INVENTION.

Please replace the paragraph beginning on line 12 page 1, with the following rewritten paragraph:

--A subsystem and a method are known from international patent application WO 94/19877. This application shows a subsystem in a mobile radio network which has a fixed base station, a repeater station and a plurality of mobile stations, the fixed base station being connected to an external telecommunication network and being connected to a mobile station by means of a transmission/reception antenna. Accordingly, this document also discloses a method for communication in a subsystem of a mobile radio network or of a wired communication network, where, in the subsystem, comprising a plurality of elements, the base station maintains a connection to a mobile radio network and possibly to a landline network and forwards this connection to the at least one mobile station.--

Please replace the paragraph beginning on line 1 of page 2 with the following rewritten paragraph:

--Reference is also made to the applicant's patent application DE 198 20 760 A1, which solves the problem of adequate coverage. This document shows a broadband communication system having a plurality of wireless communication appliances connected to the telephone network via repeater stations, where the repeater stations are connected to the power supply network and communicate with one another via the latter.--

Please insert on page 2, before line 25 the following paragraphs:

--WO 94/03993 discloses an in-house branch exchange in which a multiplicity of wireless base stations are connected, this "wireless" in-house branch exchange using a frequency scanner to carry out for identification and selection of frequencies.

SUMMARY OF THE INVENTION.

In one embodiment of the invention an in-house subsystem in at least one of a mobile radio network and a wired communication network, a fixed home base station, at least one repeater station, at least one mobile station and at least one transmission/reception antenna for connection either to the at least one mobile station or to the at least one repeater station. The fixed home base station having at least one connection means to an external telecommunication network and at least one transmission/reception antenna for internal connection to the at least one repeater station. The at least one repeater station having at least one connection element for connection either to one of the home base station or to another repeater station and the at least one mobile station having one of the transmission/reception antennas for communication with at least one of the mobile radio network or with a repeater station, wherein the elements of the subsystem have means which automatically organize the splitting of system resources between the fixed home base station, the at least one repeater station and the at least one mobile station.

In one aspect of the invention the subsystem wherein the means for automatic organization at least comprise an algorithm for automatically splitting the system resources between intermediate connections present in the fixed home base station, the at least one repeater stations and the at least one mobile station, each element of the subsystem automatically using the system resources on the basis of the same algorithm.

In another aspect of the invention the subsystem, wherein the connection means in the fixed home base station is a transmission/reception unit for wireless communication with at least one of the mobile radio network or the wired connection to a landline telecommunication network.

In still another aspect of the invention the subsystem, wherein one connection element in the repeater station is at least one of the transmission/reception antenna a cable connection.

In yet another aspect of the invention wherein, in the case of at least one line of connection, the communication from the fixed home base station to the mobile station is routed via at least one repeater station.

In another aspect of the invention the subsystem, wherein the system resources split among one another include at least different frequencies.

In still another aspect of the invention wherein the system resources split among one another include at least different timeslots.

In yet another aspect of the invention the subsystem wherein the system resources split among one another include at least different Code Division Multiple Access codes.

In another aspect of the invention the subsystem wherein each mobile station, each repeater station and the fixed home base station have a respective personal identification number and the repeater stations and/or the fixed home base station has a means for distinguishing between mobile stations with access authorization and mobile stations without access authorization.

In still another aspect of the invention the subsystem wherein the means for distinguishing between mobile stations with access authorization and mobile stations without

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access authorization has a data memory which includes the personal identification number of mobile stations with access authorization.

In yet another aspect of the invention the subsystem wherein the subsystem is connected to the mobile radio network on the basis of a Frequency Division Duplex method and the connection in the subsystem is based on a Time Frequency Division Duplex method.

In another aspect of the invention the subsystem as claimed in claim 1, wherein, in the case of one repeater station, said repeater station has means for implementing transfer and/or acceptance of the mobile station to/by the fixed home base station.

In yet another aspect of the invention the subsystem wherein in the case of at least two repeater stations, said repeater stations have means for implementing connection transfer for the mobile station among the repeater stations.

In still another aspect of the invention the subsystem wherein at least one repeater station has means for implementing connection transfer and connection acceptance for the mobile station between the mobile radio network and the repeater stations.

In another aspect of the invention the subsystem wherein the subsystem is associated with a Global System for Mobile Communications network.

In still another aspect of the invention the subsystem wherein the subsystem is associated with a Universal Mobile Telecommunications System network.

In yet another aspect of the invention the subsystem wherein the subsystem's landline network connection is associated with a Integrated Services Digital Subscriber Line network.

In another aspect of the invention the subsystem wherein the subsystem's landline network connection is associated with a Public Switched Telephone Network.

In still another aspect of the invention the subsystem wherein the subsystem's landline network connection is associated with a power supply network/powerline network.

In yet another aspect of the invention the subsystem wherein the subsystem's landline network connection is associated with a Digital Subscriber Line/Asymmetric Digital Subscriber Line network.

In another embodiment of the invention a method for communication in a subsystem of at least one of a mobile network and a wired communication network, the subsystem comprising: a home base station; at least one repeater station; and at least one mobile station where the home base station maintains a connection to at least one of a mobile radio network and a landline network, and forwards the connection to the at least one mobile station using the at least one repeater station, wherein one repeater station automatically splits the resources.

In one aspect of the invention the method wherein the resource splitting includes splitting used frequencies and/or used timeslot and/or Code Division Multiple Access code.

In still another aspect of the invention the method wherein the mobile station or home base station which initiates the logical connection setup starts the automatic use of the resources between itself and the next connection element in the logical connection chain, and, if there are one or more repeater stations in the logical line of connection, the respective repeater station performs channel setup for the next element, including automatic resource use.

In yet another aspect of the invention the method wherein a repeater station serves a plurality of mobile stations at the same time.

In another aspect of the invention the method wherein the repeater station transmits on a Broadcast Control Channel a list of resources already used which cannot be used by the mobile station initiating a connection.

In yet another aspect of the invention the method wherein the connection setup is initiated from the landline network and/or mobile radio network incoming call.

In still another aspect of the invention the method wherein it is carried out for the connection setup is initiated by the subsystem outgoing call.

In another aspect of the invention the method wherein the subsystem performs the connection transfer procedures between various repeater stations and/or between a repeater station and the home base station.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates an exemplary subsystem of the invention for a building complex.

Figure 2 illustrates an exemplary subsystem of the invention with a different repeater split.

DETAILED DESCRIPTION OF THE INVENTION--

Please replace the paragraph beginning on line 25 of page 2 with the following rewritten paragraph:

--The invention describes an in-house subsystem in a mobile radio network and/or in a wired communication network and a method for communication in a subsystem of a mobile radio network and/or of a wired communication network which provides satisfactory transmission/reception coverage for the mobile stations even in relatively large buildings and building complexes, including in the associated open-air installations.--

Please replace the paragraph beginning on line 1 of page 3 with the following rewritten paragraph:

--The inventors discloses an in-house subsystem in a mobile radio network and/or in a wired communication network which comprises, for example, a fixed home base station, at least one repeater station (repeater) and at least one mobile station, the fixed home base station having at least one connection means to an external telecommunication network and at least one transmission/reception antenna for internal connection to the at least one repeater station, the at least one repeater station having at least one connection element for connection either to the home base station or to another repeater station, and at least one transmission/reception antenna for connection either to the at least one mobile station or to another repeater station, and the at least one mobile station having a transmission/reception antenna for communication with the mobile radio network or with a repeater station, the elements of the subsystem having means which automatically organize the splitting of the system resources between the home base

station, the at least one repeater station and the at least one mobile station. The way in which automatic organization works is explained in more detail further below.--

Please replace the paragraph beginning on line 24 of page 3 with the following rewritten paragraph:

--The term “in-house” in the context of the subsystem is used in the sense of the term “residential”, as used generally in specialist circles, and is used to distinguish from “public” systems.--

Please replace the paragraph beginning on line 29 of page 3 with the following rewritten paragraph:

--In the subsystem according to the invention, the means for automatic organization may at least comprise an algorithm for automatically splitting the system resources between intermediate connections present in the home base stations, the at least one repeater stations and the at least one mobile station, each element of the subsystem automatically using the system resources on the basis of the same algorithm.--

Please replace the paragraph beginning on line 1 of page 4 with the following rewritten paragraph:

--In one embodiment, the connection means in the home base station are/is a transmission/reception unit for wireless communication with a mobile radio network and/or are/is a wired connection to a landline telecommunication network.--

Please replace the paragraph beginning on line 6 of page 4 with the following rewritten paragraph:

--In another embodiment, of the subsystem, in the case of at least one line of connection, the communication from the home base station to a mobile station is routed via at least one repeater station or via a plurality of repeater stations communicating with one another.--

Please replace the paragraph beginning on line 17 of page 4 with the following rewritten paragraph:

--Each mobile station, each repeater station and the home base station have a respective PIN (PIN = Personal Identification Number), and the repeater stations and/or the home base station have a means for distinguishing between mobile stations with access authorization and mobile stations without access authorization. Advantageously, the means for distinguishing between mobile stations with access authorization and mobile stations without access authorization can also have a data memory which contains the PIN of mobile stations with access authorization.--

Please replace the paragraph beginning on line 36 of page 4 with the following rewritten paragraph:

--The at least one repeater station may have means for implementing transfer and/or acceptance of the mobile station (handover) to/by the home base station and/or to/by another repeater station. This allows a mobile station to move freely within the coverage area of the subsystem while the connection of the mobile station is routed via different connection paths and repeater stations, according to location, or is changed over between different repeater stations and connection paths.--

Please replace the paragraph beginning on line 9 of page 5 with the following rewritten paragraph:

--The at least one repeater station may alternatively have means for implementing connection transfer and connection acceptance for the mobile station (handover) between the mobile radio network and the repeater stations. This achieves further improved mobility for the mobile stations, since unproblematical transfer between an internal connection in the subsystem to the external connection in the mobile radio network is now also possible, without the user's communication being disrupted by this process.--

Please replace the paragraph beginning on line 20 of page 5 with the following rewritten paragraph:

--The subsystem described above can, by way of example, be associated with the GSM network (GSM = Global System for Mobile Communications) and/or with the UMTS network (UMTS = Universal Mobile Telecommunication System). Similarly, the subsystem's landline network connection can be associated with the ISDN network (ISDN = Integrated Services Digital Network), with the PSTN network (PSTN = Public Switched Telephone Network), with the power supply network/powerline network and/or with the xDSL/ADSL network (xDSL = general generic term for Digital Subscriber Line, ADSL = Asymmetric Digital Subscriber Line). One having ordinary skill will recognize that the invention is not limited to these embodiments.--

Please replace the paragraph beginning on line 33 of page 5 with the following rewritten paragraph:

--The invention which is set above by means of a method for communication in a subsystem of a mobile radio network and/or of a wired communication network, where, in the subsystem, which comprises a plurality of elements including a fixed home base station, at least one repeater station and at least one mobile station, the home base station maintains a connection

to a mobile radio network and possibly to a landline network and forwards this connection to the at least one mobile station using the at least one repeater station, and the at least one repeater station automatically splits the resources. This automatic splitting of resources represents automatic organization of the system, the operation of which will be explained in more detail below.--

Please replace the paragraph beginning on line 14 of page 6 with the following rewritten paragraph:

--In the preferred embodiment, it is preferable that the element (i.e., mobile station or base station) which initiates the logical connection setup starts the automatic use of the resources (i.e., setup/clear-down of the data channels) between itself and the next connection element in the logical connection chain. If there are one or more repeater stations in the logical line of connection, the respective repeater station performs channel setup for the next element, including automatic resource use.--

Please replace the paragraph beginning on line 24 of page 6 with the following rewritten paragraph:

--In another embodiment, a repeater station can serve a plurality of mobile stations at the same time. This may be done, for example, by virtue of the repeater station(s) operating at a plurality of frequencies at the same time, or each mobile station being assigned one or more timeslots in successive time frames.--

Please replace the paragraph beginning on line 31 of page 6 with the following rewritten paragraph:

--One option for splitting the available system resources can involve the repeater station transmitting on a particular, predefined resource (frequency, code, timeslot), e.g. on a BCCH (Broadcast Control Channel), or in a particular free timeslot a list of resources already used. In

this way, a mobile station potentially initiating a connection knows which resources cannot currently be used.--

Please replace the paragraph beginning on line 10 of page 7 with the following rewritten paragraph:

--With similar advantage, the invention also provides the opportunity to use the method described above within the subsystem for hand over procedures between the various repeater stations and/or between a repeater station and the base station.--

Please replace the paragraph beginning on line 15 of page 7 with the following rewritten paragraph:

--The automatic organization in terms of resource splitting denotes a search algorithm which is implemented by the base station, the repeater station and/or the mobile station and assesses the free system resources - which usually comprise frequency, code and timeslot indices - using a quality criterion (e.g. RSSI = Radio Signal Strength Indication = measurement of reception field strength, checking of CRC bits), to determine the extent to which the resources are disrupted or used, and uses a cyclically refreshed look-up table (for frequency, code and timeslot index) to decide which resource is used for data transmission.--

Please replace the paragraph beginning on line 5 of page 8 with the following rewritten paragraph:

--In large volumes of traffic, the repeater station can use the BCCH to inform the mobile stations of which resources are already used or which resources cannot be used. This prevents faults (e.g. the simultaneous attempt by two mobile stations to access the same resource).--

Please delete lines 12-16.

Please replace the paragraph beginning on line 17 of page 8 with the following rewritten paragraph:

--One having ordinary skill will appreciate that the invention mentioned above, and to be explained below, can be used not only in the particular combination indicated, but also in other combinations or on their own.--

On page 8, please delete lines 26-29.

Please replace the paragraph beginning on line 31 of page 8 with the following rewritten paragraph:

--Figure 1 is a schematic illustration of an inventive subsystem with its elements in a building complex having four building parts A-D. The building part A includes a home base station 3 connected to a mobile radio network 1 via an external transmission/reception antenna 4. The mobile radio network may be, by way of example, a GSM network, UMTS network or other mobile radio network. In addition, the base station is connected by means of a wire line 22 to a landline network, e.g. to the ISDN network, PTSN network or another hardwired communication network 2. For internal communication, the home base station 3 has a transmission/reception antenna 5 which it can use to connect to the other mobile stations 17 and repeater stations 7 and 8 in the building part A.--

Please replace the paragraph beginning on line 13 of page 9 with the following rewritten paragraph:

--The repeater station 8 has a transmission/ reception antenna 12 and 13 situated in the building part A and in the building part B. The building part B also includes a transmission/reception antenna 14 for the repeater station 9 from the building part D. The repeater station 9 also has a transmission/reception antenna 15 for the building part D.--